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Worldwide Report

NUCLEAR DEVELOPMENT AND PROLIFERATION

No. 87

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CONTENTS

NEAR EAST AND NORTH AFRICA

LATIN AMERICA

BRIEFS

SWEDEN, AUSTRALIA SIGN ACCORD--On Wednesday OKG, Oskarshamnsverkets Power Group, Inc., signed a contract in Australia for the purchase of Australian uranium for the three Swedish reactors in Oskarshamn, O1, O2 and O3, for a total of 1 billion kronor. The deal was concluded in Canberra on Wednesday with Energy Resources of Australia, ERA. OKG executive director Lennart Fogelstrom and OKG chairman of the board Goran Ekberg said that Sweden is now assured of uranium deliveries for a long time to come. The agreement with ERA also involved OKG's purchasing 1 percent of the ERA shares. ERA owns the Ranger mine in northern Australia. The Ranger mine lies about 8 miles south of Darwin in Northern Territory and ore is being mined there at full capacity. In all OKG will buy 2400 tons of uranium in the period 1982-96. That is about half the uranium needed by the Oskarshamn reactors in the same period. OKG has commented with regard to the deal that there is still room for a purchase of Swedish uranium in the future. [Text] [Stockholm SVENSKA DAGBLADET in Swedish 29 Jan 81 p 6] 6578

EGYPT, FRANCE AGREEMENT--Beijing, 10 Mar (XINHUA--Egyptian and French energy officials yesterday initialled a nuclear power cooperation agreement and an accompanying protocol accord, according to Western news agency reports. The agreement in principle was signed during a visit to Paris by Egyptian President Anwar al-Sadat in February. Under the agreement, France will sell to Egypt two 1,000-megawatt nuclear power plants, plus the necessary fuel and technology. Egypt plans to have eight nuclear plants by the year 2000 to provide 40 percent of its energy needs. The agreement deals with cooperation from research and extraction of ore to the building of the nuclear reactors. [Text] [OW100252 Beijing XINHUA in English 0245 GMT 10 Mar 81]

CSO: 5100

BRIEFS

NIOBIUM BEING PRODUCED--Shillong, Feb 24--Niobium, a vital metal used in nuclear reactors will now be commercially produced for the first time in India. A phyrochlora concentration plant, from which the metal niobium is obtained, will be set up in the northeastern state of Meghalaya by next year. Niobium is used in nuclear reactors as sheath because of CTS superior resistance to corrosion and ability to withstand enormous heat produced in atomic reactors.--UNI [Text] [Karachi MORNING NEWS in English 25 Feb 81 p 8]

CSO: 5100

CONSTRUCTION OF NUCLEAR TEST-REACTOR TO BEGIN IN 1981

Jakarta KOMPAS in Indonesian 26 Dec 80 p 1

[Text] Emil Salim, minister of State Environmental & Developmental Protection Agency, emphasized the necessity for an Environmental Impact Study in relation to the construction of the Nuclear Test Reactor at the Kompleks Puspiptek (Center for Technology and Science Research Development) in Serpong, in order to more readily solve the problems that may arise later.

"Yes, indeed it's necessary to carry out an Environmental Impact Study (ADL) for the construction of the Nuclear Test Reactor in Serpong," said Emil Salim, after meeting with Professor Baquini, the director general of the National Atomic Energy Commission (BATAN), on Wednesday.

During their conversation, Professor Baquini stated that the construction of the 30 MegaWatt (MW) nuclear test reactor was going to begin next year. It is hoped that it will be completed in 2 years.

"As a matter of fact," continued the director of BATAN, "the nuclear test reactor that will be built next year is not a nuclear electrical power plant, as was indicated by the press some time ago. They said that Indonesia would construct a nuclear electrical power plant next year.

This nuclear test reactor represents the bridge that leads to the building of a nuclear electrical power plant (PLTN). The test reactor will function as the medium for testing the burn (firing) materials, the equipment, and furthermore, train the personnel that will be required for the development and the operation of the nuclear electrical power plant."

Baquini acknowledged that until this year, 1980, the government has not yet made a decision when the first nuclear electrical power plant will be built in Indonesia. Although in a feasibility study carried out between Italy and Indonesia, it was suggested that a decision be made in 1980 so that the nuclear electrical power plant could be in operation by 1989. "Therefore an environmental impact study is a must and should not be carried out merely as a formality in order to fulfill a responsibility for some construction activity," he said. ["he" in this case refers to a Mr Nabil, section of article omitted. He is speaking from their experience with the Asahan Project where no Environmental Impact study was carried out prior to the project.]

8323
CSO: 5100

FOUR COUNTRIES OFFER NUCLEAR TECHNOLOGY FOR POWERPLANTS

Jakarta SINAR HARAPAN in Indonesian 6 Jan 81 pp 1, 12

[Article: "Several Advanced Nations Offer Nuclear Technology to Indonesia"]

[Excerpt] Recently a group of advanced nations have offered nuclear technology to Indonesia. In the past 6 months, three West European countries and a North American country have vied to promote their expertise in building PLTN [nuclear powered electric power plants] in Indonesia.

The West European countries are Italy, Germany and France and the fourth country is Canada in North America. The flare-up of interest is due principally to the expectation that a positive approach will be forthcoming from the government at any time toward deciding on the construction of the first PLTN in Indonesia, Budi Sudarsono, an expert staff member of BATAN [National Atomic Energy Agency] Directorate General and chairman of the committee for the PLTN Development Preparation Commission, told SINAR HARAPAN in his office on Monday afternoon [6 January].

A feasibility study which determined the site for the Indonesian PLTN has just been completed by BATAN together with Italian nuclear experts from NIRA, the Italian National Atomic Agency. The site chosen is on the north coast of Java near Lasem and Rembang. The NIRA role was strengthened with the signing of an Indonesian-Italian nuclear cooperation agreement by Prof A. Baiquni, director general of BATAN, and Prof Umberto Colombo, president of CNEN (Comitato Nazionale per l'Energia Nucleare) in October 1980 in Jakarta.

While BAKOREN (National Energy Coordination Agency) headed by Minister of Energy Prof Subroto is occupied studying the feasibility study, it was announced that Atomic Energy of Canada Ltd experts have invited BATAN experts to discuss performance and the work on the CANDU type reactor on 27 and 28 January. This type of reactor is said to give the best performance compared with that of other types of reactors. CANDU is short for Canadian Deuterium Uranium and there is evidence that this type of reactor uses natural uranium as its fuel along with heavy water (heavy hydrogen) for cooling. The availability of natural uranium in Indonesia means that our country will not have to depend on an overseas supply of uranium. On the other hand, other reactor types use enriched uranium which requires special facilities and technology for enriching uranium. Such facilities have not yet been developed in Indonesia, Budi Sudarsono said.

Results of the discussions between BATAN and Atomic Energy of Canada Ltd experts will be presented to the minister for Mining and Energy as the chairman of BAKOREN. Canada is the first country to operate the CANDU-type PLTN (PHWR--pressurized heavy water reactor). All Canadian PLTN are of this type.

However, Budi Soedarsono said, similar presentations were submitted to the minister of Mining and Energy 6 months ago, in June 1980, by German experts working for KWU (Kraft Werk Union AG). They offered to develop all types of electric power plants --hydroelectric, diesel powered, steam powered, geothermal and nuclear electric power plants--including the PHWR and CANDU types.

France is the fourth nation that offered its services in the nuclear field. Actually this country participated in probing for possibilities of prospecting and exploitation of uranium in various locations in Indonesia several years ago, but its role was discontinued for a number of reasons. French nuclear experts are now actively promoting PLTN technology to Indonesia. According to plan, a meeting has been organized between Indonesian and French experts in Jakarta in March 1981.

6804
CSO: 5100

NATION NEEDS PLANT TO REPROCESS URANIUM

Karachi DAWN in English 26 Feb 81 p 6

[Article by Munir Ahmad Khan]

[Text]

LONDON, Feb. 25: Pakistan needs a reprocessing plant to enable it to recover unburnt uranium which can be reused in new power reactors, according to Mr. Munir Ahmed Khan, Chairman, Pakistan Atomic Energy Commission (PAEC).

One of the conclusions of the recently held International Nuclear Fuel Cycle Evaluation (INFCE) is that nuclear fuel reprocessing is not only desirable but necessary to make the best use of uranium resources and to ensure proper waste disposal, he said in a wide-ranging interview published in the renowned magazine "New Scientist" here.

We do not accept the thesis that for economic reasons reprocessing enrichment and fast breeder reactors should be confined to a few countries which either have large nuclear programmes or extensive uranium resources.

"Those who criticise reprocessing plants want us to depend upon them for the essential supplies of the reactor fuel. This is not acceptable. A power reactor is almost a billion dollar project and cannot be left to the mercy of others", the PAEC Chairman said.

We have been singled out for criticism because we have chosen to take the plutonium route to nuclear technology. As far as we are concerned, without plutonium there can be no efficient breeder reactor and without breeders the full potential of nuclear power cannot be realised", he added.

Mr. Munser further said, "since we cannot attain a credible nuclear deterrent, possessing a few nuclear weapons will not add to our security; it may in fact endanger it", he said. He nevertheless admitted that proliferation was a serious problem—but you cannot solve the problem by limiting nuclear technology to the privileged few.

Nuclear technology has already spread and cannot be retrieved. Technical safeguards deserve our fullest support and they themselves cannot ensure non-proliferation because the incentive towards proliferation springs from insecurity and the political climate in which we live.

To strengthen the non-proliferation regime we must also control the vertical proliferation, the stockpiling of more and more destructive nuclear weapons, which pose the most awesome threat to human survival", he observed.

MATTER OF SURVIVAL

He stressed that nuclear power was simply a matter of survival for many developing countries. "We are pursuing a nuclear power programme not because of prestige or for political reasons. The developed nations have no conception of how the energy crisis has hit us—what it means for our future.

He said in the US an average citizen consumes some 10,000 units of electricity per year. In Europe, this consumption was between 6,000 to 9,000 units per capital. The world average was about 1,600 units per capita per year and even in the poorer nations of Asia the average was more than 300 units per year.

Pakistan has few other energy sources. "The US can consume Pakistan's entire reserve of coal, oil and gas in just over one year", he added.

"The industrialised nations are threatening to invade the oil fields of the Middle East because they have to spend 10 per cent of their export earnings on oil imports. By 1985 we would have to spend 100 per cent of our export earnings if we did not have nuclear power. Can you imagine the catastrophe it will be for us", the PAEC chief said.—PPI.

CSO: 4220

BRIEFS

EQUIPMENT FOR NUCLEAR POWER STATION--The Klement Gottwald Iron and Machine Building works in Vitkovice has produced the first CSSR-made steam generator for the VVER 440 nuclear reactors. The steam generator, which will be used at the nuclear power plant in Jaslovske Bohunice, is 13 meters long, 3.5 meters in diameter, and weighs 162 tons. [Prague SVOBODNE SLOVO in Czech 6 Mar 81 p 4]

CSO: 5100

DETERMINATION TO DEVELOP NUCLEAR ENERGY EMPHASIZED

Baghdad BAGHDAD OBSERVER in English 24 Feb 81 p 2

[Article by L. Y. Barkhot "Iraq's Peaceful Uses of Atomic Energy"]

[Text] Although the nuclear cooperation agreement concluded between Iraq and France in 1975 aims primarily at the peaceful uses of the atom, it has been the object of a major hostile publicity campaign waged by the zionist entity.

Last July, the zionist defence undersecretary declared that his entity would do everything possible to prevent France from supplying Iraq with enriched uranium. "Israel", he said, "would first resort to political and diplomatic means, if this fails it must adopt other necessary measures".

There is ample evidence that the zionist entity has tried its best to foil Iraq's endeavour to acquire nuclear energy for peaceful purposes.

The zionist 'other necessary measures' have culminated in three incidents with a view to hinder Iraq's peaceful nuclear pursuits. First, the destruction of a French built nuclear reactor on its way to be shipped to Iraq. The second, the assassinatoin of the Egyptian born scientist, Dr. Yahya al-Mashad in Paris. Dr. Yahya was working along with other scientists in the Iraqi Atomic Energy Centre.

In the early days of Iraq-Iran war, the Iraqi reactors once again got headlines in the zionist entity's mass media. The hostile publicity campaign subsided when the Centre was bombarded by phantoms jets on September, 30.

The Iraqi General Command of the Armed Forces did not announce the bombing of the reactors in its following statement for certain tactical and logistical reasons. Surprisingly enough, the Iranians made no mention of the reactor in their statements of September 30, and October, 1. Further they denied that their planes had bombed the Centre.

Le Monde's correspondent in Tel Aviv Mr. Francias Cornot disclosed the vicious hands behind the bombing of the Centre. Being a specialist in the zionist entity's political affairs and zionist-Arab conflict and due to his acquintance of a number of zionist officials outside the government, the correspondent adds authenticity to his article published in Le Monde a few days after the bombing of the Centre.

In his article, Mr. Cornot quoted the zionist military intelligence chief as saying before September, 30: "I'm really surprised why the Iranian planes have not yet attacked the Iraqi nuclear reactors". In the first two days, prior to the attack, the correspondent adds,

the zionist press published detailed information on the Iraqi nuclear reactors. Following the bombing and Iran's denial of it, the 'detailed information' no longer was headlined by the zionist press.

To encounter the zionist hostile propaganda campaign and foil the conspiracies aimed at denying Iraq the right to the peaceful uses of nuclear energy, this country, has on many occasions reaffirmed acceptance of the controls of the Vienna based International Atomic Energy Agency (IAEA).

Like other countries of the world Iraq has a legitimate right of access to the peaceful uses of nuclear energy. Iraq is a signatory of the nuclear non-proliferation treaty, whereas the zionist entity has strongly refused to sign the treaty.

According to (IAEA), 75 nuclear research reactors, most of them American, are currently in service in 35 countries and all of them operate on enriched uranium.

Iraq will not be deterred by the zionist hostile campaign and will succeed in its endeavour to acquire nuclear energy in accordance with international agreements.

President Saddam Hussein touched upon this subject in the press conference held on November, 13. The President said: "We will acquire atomic energy by all possible means, within the framework respecting international agreements including the nuclear non proliferating treaty."

CSO: 5100

BRIEFS

URANIUM FROM CHINA--New York, 28 Jan (UPI). According to reliable intelligence sources, China has agreed to provide Iraq more than 100 pounds of enriched uranium fuel--enough to produce two atomic bombs. The sources noted that this is the first time that Peking is providing nuclear materials or know-how to another country. The conditions of the transaction were worked out during the visit of a senior Chinese official to Baghdad last month. The sources added that the two parties will soon sign the agreement in its final form. Under the terms of the transaction, Peking will provide Iraq about 120 pounds of enriched uranium for use in the nuclear reactor now located near Baghdad. The construction of the reactor was delayed last year because of Iranian air strikes in the early stages of the war between Iran and Iraq. [Text] [Tel Aviv HA'ARETZ in Hebrew 29 Jan 81 p 1] 5830

CSO: 5100

BRIEFS

POWER STATION PLANS--As projected according to current plans, starting in 1992 three to four nuclear power stations will be constructed, each with a capacity of 1000 megawatts, Director General of the Atomic Energy Commission 'Uzi 'Ilam said Friday at the engineering club in Tel Aviv. Mr 'Ilam added that according to this projection the production of nuclear electricity in the year 2000 will amount to 25 to 40 percent of the electrical output of the country. He also noted that in the rest of the world as well as in Israel, nuclear energy arouses various deep-rooted myths and superstitions, fears and ignorance, which are sometimes exploited for political ends. According to him: as a result of such irrational conduct, builders of nuclear stations are forced to wrestle not only with technical and economic problems, but also with emotional attitudes and political heavy-handedness. [Excerpt] [Tel Aviv HA'ARETZ in Hebrew 8 Feb 81 p 7]

CSO: 5100

CASTRO MADERO REVIEWS 1980 ACHIEVEMENTS, STRESSES NUCLEAR INDEPENDENCE

Buenos Aires LA PRENSA in Spanish 14 Feb 81 p 4

[Text] During a press conference held in the offices of the CNEA [National Atomic Energy Commission], which reports directly to the president of the nation, the head of that organization, Vice Adm Carlos Castro Madero, reviewed the CNEA's 1980 accomplishments.

His presentation included slide projections, and at its conclusion Vice Admiral Castro Madero responded to several questions aimed at clarifying certain points in his rundown.

Before opening the meeting, Vice Adm Castro Madero stated he would touch on the agency's main achievements during the year just past under each of the the programs that bring together the functions of that body, indicating that a number of significant related accomplishments had resulted in major advances in the implementation of the Argentine Nuclear Plan, and that speedups in other acvities currently under way had provided the bases for key projects designed to consolidate the mentioned plan's objectives.

Nuclear Power Plants

With reference to the power plant programs, the head of the CNEA indicated that the necessary agreements had been signed with the government of the FRG [Federal Republic of Germany] for the procurement of the equipment, services and technology to install the third Atucha II nuclear plant. A set of contracts was signed also with the KWU company, he added, to obtain for the same plant: supplies, services, guarantees, technology, licenses and assistance relative to the fabrication of heavy components, "know-how" and engineering licenses, and technical cooperation on technology and nuclear fuel.

"To satisfy the requirement that our country acquire its own nuclear power plant design and construction capability, and to attain an adequate level of self-sufficiency as regards components and equipment, the ENACE [Argentine Nuclear Enterprise for Power Plants] was formed," he continued.

"The ENACE's functions," he said, "include the basic engineering design of future power plants, project management, administration and followup of procurement, supervision of construction, assembly and startup of these plants, training of

personnel and provision of necessary operation and maintenance support. These activities will be carried out with a view to fostering the development of Argentine engineering and industry.

"The capital stock of the ENACE, a 'corporation in which the state is the majority stockholder,' is held by the CNEA to the extent of 75 percent and by the KWU company to the extent of the remaining 25 percent. A gradual phasing out of KWU's holding has been agreed, to attain Argentine ownership of the entire stock package.

"The new enterprise was officially registered on 5 November 1980 and began its work immediately."

National Construction

Castro Madero then stressed: "The decision was adopted that Argentine national industry start building the major components for the nuclear sector.

"By order of His Excellency the President of the Republic, an interministerial commission was formed to lay down the protective terms of reference that must be met by foreign bids, based on the fabrication of major components within our own country, representing a major technological stride toward our nation's self-sufficiency and self-reliance in our negotiations with the supplying countries. As a result of that commission's work, a contract was signed with a private Argentine enterprise for the fabrication of two steam generators, three moderator coolers and the pressurizer.

"By way of all these agreements and contracts," he pointed out, "the CNEA assumed responsibility for the construction of the Atucha II power plant, representing a significant step forward toward qualifying the country in the various phases of design, installation, assembly and putting into operation of nuclear power plants. At the same time, national industry will be more actively developed to supply nuclear components, with special emphasis on those representing a real technological step forward.

"Formal renegotiation talks were opened in Ottawa in April and November with the AECL and Italimpianti companies, by way of which the CNEA assumed the role of principal construction contractor in the nuclear sector of the Embalse nuclear plant, which has resulted in the elimination of a number of bottlenecks that were interfering with the progress of that project.

"This has speeded up its forward pace, making it possible now to target bringing the plant up to criticalness by August 1982, cutting it into the electrical network by September, and bringing it up to full power output by November of that same year.

"The Atucha I nuclear power plant continues on its longest uninterrupted period of operation since its entry into service in 1974. This period of continuous operation at full power output, which attained its 165th day on 31 December 1980, is today in its 206th day," he stated.

Nuclear Supplies

Regarding nuclear supplies, Castro Madero pointed out: "A contract was signed with Sulzer Brothers Limited, a Swiss company, for the construction in our country of a heavy water industrial plant. This plant, the first in Latin America, represents a foundation stone in the implementation of a program of nuclear independence that has opted for the natural-uranium line of reactors.

"The pilot fuel-element plant for the Atucha I power plant," he stressed, "has attained a production line rate of one fuel element a day, which signifies that the process of fabrication and quality control have now been optimized and a production reached that justifies its immediate transfer to an industrial plant.

"The civil engineering works for the fuel-element factory of this industrial plant have been completed, and installation of equipment and ancillary services has begun.

"The process for manufacturing zircaloy tubes for nuclear fuel elements was mastered, and, using delicate lamination techniques, we produced the first tubes within the required tolerances.

"A new record was achieved for the production of uranium concentrates. The 220 tons produced in 1980 represent about 22.2 percent more than had been projected for the year and an increase of some 39.6 percent with respect to 1979.

"Work continued in 1980 toward ensuring the uranium supplies needed to carry out the Nuclear Plan, and, to this effect, a contract was signed to exploit the Sierra Pintada deposit and to build a 700-ton-per-year uranium concentrate plant.

"A contract was signed with the private owner of the La Estela mine in the province of San Luis for its exploitation. For the first time in a contract with a private individual, the proprietor assumed responsibility as well for the production of the uranium concentrate contained in the extracted ore.

"Reasonably assured resources were increased by 1,150 tons of U_3O_8, a 4-percent increase over the total, which now comes to 29,400 tons.

"The National Executive issued Decree 2765/80 facilitating participation by foreign capital in uranium exploration and exploitation, by making it possible to export the uranium in exchange for sharing in the related technology, over and above the proved reserves needed to accomplish the Nuclear Plan."

Radioisotopes and Radiation

Castro Madero then continued, indicating that "A joint resolution was adopted with the Secretariat of State for Public Health putting into effect operating standards for radiation therapy and nuclear medicine units, thus optimizing the operation of these units throughout the nation.

"The demand for radioactive substances increased by about 43 percent over that of the previous year, as a result of the informational efforts deployed by the CNEA," Castro Madero pointed out.

"The technical assistance offered to the provincial governments in public health matters," he said, "enabled them to advance the development of regional services. Specifically, operation of the Neuquen Oncological Center was begun, competitive bids were requested and contracts awarded for construction of the building to house the Chaco Bionuclear Services Center, and plans for the Chubut Bionuclear Services Center were finalized and submitted to competitive bidding.

"With the creation of the department for diagnosis by electronic microradiography in the Clinicas Jose de San Martin Hospital, as the result of an agreement among the Secretariat of State for Public Health, the University of Buenos Aires and the CNEA, a modern conception of clinical diagnosis was given substance, based on which a new subject will now be incorporated in the medical studies program: electronic microradiography diagnosis."

Radiological Protection

The head of the CNEA then addressed the theme of radiological protection and safety, pointing out that with the agreement of the College of Engineering of Buenos Aires and the Secretariat of State for Public Health, a postgraduate course was set up, for the first time, in radiological protection and nuclear safety. This course, he explained, was incorporated as an international course by the IAEA [International Atomic Energy Agency]. He explained further that "the demand for protective services and devices at nuclear installations was satisfied; an active part was taken in the development and formulation of international criteria and standards for radiological protection and nuclear safety; work continued on licensing the Embalse nuclear power plant from the nuclear safety standpoint and the basic criteria were established for the licensing of the Atucha II nuclear power plant; and 110 new centers using radioactive materials were licensed to operate, from the nuclear safety standpoint."

Research and Development

In addition to the aforementioned technological developmental work on fuel elements and zircaloy tubes, he pointed out that: "The construction, assembly and testing of the pressure vessel for the heavy-ions accelerator was completed. This part of the project, carried out entirely by our national industry, is of a higher quality than that of similar installations in other countries, according to the inspecting organization: Electrostatics International, Inc.

"The materialization of this project will provide our country with a scientific tool to maintain and raise its international standing in the field of nuclear physics.

"The civil engineering works for the Bariloche Atomic Center's reactor reached 76 percent completion. This center will be devoted to nuclear engineering studies.

"The body of new knowledge generated under this program during 1980 gave rise to 340 technical and scientific reports, a large percentage of which were disseminated in publications having an international circulation."

Management, Training and Support

In the concluding portion of his presentation, Vice Admiral Castro Madero pointed out that certain of the program's metropolitan area activities warranted special mention:

"In February, and in accordance with the planned timetable, the foundation stone was laid at the Peruvian atomic center in Huarangal, symbolizing the finalization of the basic engineering developmental stage for that center's installations; civil engineering works and the fabrication of its principal electromechanical components were begun; and nuclear cooperation agreements were signed with the officially responsible Brazilian institutions in that field of activity. This was an important step toward regional integration, and at the same time demonstrated the fallacy of the arguments being used to deny technology to both our countries by invoking an imaginary nuclear arms race. Nuclear cooperation agreements were also signed with Venezuela and Colombia, as were agreements to intensify existing cooperation agreements with Bolivia and Uruguay by way of several plans of action."

Referring to the international ambit, he added that: "The first nuclear meeting of the nonalined nuclear cooperating countries was held in Buenos Aires. Within the framework of cooperation among those countries and unification of a coherent policy to be sustained in the conference on revision of the nonproliferation treaty, in the IAEA, and in the United Nations, that policy aims to strengthen the position of the receiving nations opposite the nuclear technology supplier nations that make up the London Club. The 24th meeting of the IAEA's Scientific Advisory Committee was also held in the Argentine capital, attesting respect for the Argentine nuclear program; and in the latest general meeting of the IAEA, Argentina was again elected to a seat on its board of governors for a 2-year period."

Concluding Remarks

Lastly, Vice Admiral Castro Madero said:

"We can characterize the balance sheet of 1980 activities as very positive. The numerous agreements and contracts signed ensure the accomplishment of the Argentine Nuclear Plan's objectives, and we have subscribed to them without any infringement of our national sovereignty or any constraints upon our freedom of action. The confidence and support the nation has vested in us have enabled us to continue forward in the implementation of the nuclear policies that have been laid down by the national government, and have at the same time committed us to giving the best that is in each of us.

"I wish to cite the ongoing support and the objective views we have received from the media. Without them, our activities could not have achieved the current level of understanding among those to whom our activities are addressed: the Argentine people."

NUCLEAR PLAN BUDGET REDUCTIONS SEEN AS DILATORY

Buenos Aires CONVICCION in Spanish 12 Feb 81 p 1

[Article by Martin Olivera: "Budget Will Slow Nuclear Plan Down"]

[Text] The CNEA (National Atomic Energy Commission), during its long existence, has already been able to get through the worst times in Argentina, emerging unharmed and even able to launch the Nuclear Plan.

On various occasions, CONVICCION has described the CNEA as a tough customer in the nation. Neither the habitual coups d'etat--both abortive and not abortive--during the early part of the seventies, nor the chaos during the period of 1973-1976 were able to stop the launching of the first Latin American nuclear power plant, nor the firm march toward atomic independence.

However, we have an economic disaster which now threatens the specific implementation of the Nuclear Plan. Yesterday, VAdm Castro Madero summoned a press conference to summarize the situation for the CNEA during 1980--a review which shows significant progress--plus projects for the future; he had to admit that these projects would be delayed for the most part due to the budget cutbacks ordered by [Ministry of] Economy in its "symbolic" project forwarded to the PEN [National Executive Body].

In a chat with CONVICCION, Castro Madero tried to minimize the matter, noting that, if cuts had to be made in the entire administration, it was only fair that the same thing should happen in the case of CNEA. But Castro Madero knows better than anybody else--although in his official capacity he could not say so--what a cutback in today's figures will mean, not considering the now constant devaluation of the peso; in other words, there is going to be a reduction on the order of 40 percent in the budget necessary for the normal accomplishment of the Nuclear Plan.

Contrary to what the economic team might think, the Nuclear Plan is not a superfluous luxury for the country.

Castro Madero yesterday admitted to CONVICCION that, if this cutback is indeed made, it will only be possible to complete the construction of the heavy-water plant at Arroyito by the required deadline plus the Embalse nuclear power plant.

The budget studies certainly did not take into consideration all of those aspects. nor was consideration given to what breaking the nuclear blockade would

mean in international terms. Somebody did not take into account the importance of this factor which is so decisive for the true image of Argentina.

It was apparently simply believed that, for the time being, the Nuclear Plan is "very expensive." But it was of course not realized that sovereignty is never cheap in terms of money.

And the Nuclear Plan is sovereignty, pure and simple.

5058
CSO: 5100

DOMESTIC FIRM TO BUILD ATUCHA II COMPONENTS

Buenos Aires LA OPINION in Spanish 14 Feb 81 p 11

[Text] Mendoza (NA)--The provincial government received 7 percent of the adjusted value of uranium and thorium extracted from the uranium-bearing district of Sierra Pintada, according to an agreement signed yesterday by Governor Rolando Ghisani and CNEA (National Atomic Energy Commission) chairman Carlos Castro Madero.

The agreement replaces the one which had been in force since 21 December 1957 and regulates the exploration and exploitation of those minerals.

On the other hand, Castro Madero announced in this capital that the CNEA--through the ENACE (Argentine Nuclear Electric Power Plant Enterprise)--agreed to the participation of the firm of IMPSA (Pescarmona Metallurgical Industries, Incorporated) in the production of heavy components for the Atucha II nuclear power plant.

Concerning the agreement signed yesterday, its main provisions relate to nuclear prospecting, payment of the mining royalties and special taxes, exploration and exploitation of nuclear mines, and the province's participation in these operations.

A report from the CNEA states, with respect to the royalties, that "the establishment specifies that 50 percent of the value of uranium or thorium recoverable in the form of commercial concentrates be allocated to the uranium and thorium minerals."

It adds that the CNEA "will reimburse the province of Mendoza for 7 percent of the adjusted value which is in this fashion allocated to said minerals."

Regarding the agreement with IMPSA, Castro Madero announced that the construction of heavy components for Atucha II involves two steam generators, one pressurizer device, and three cooling units for the moderator.

In this connection he explained that the former are intended to extract the heat that is generated in the reactor as a consequence of nuclear fission and to transfer it to the secondary circuit, where the steam, that powers the plant's turbine, is generated.

The pressurizer device regulates the pressure to which we subject the heavy water inside the reactor, while the cooling units of the moderator do the same kind of work with the temperature of the liquid that moderates the reaction.

The CNEA chairman stressed the fact that this is the first time that Argentina is contemplating the construction of parts with these technical features.

He finally noted that the award of the contracts announced earlier to an Argentine company is in line "with the policy of developing an Argentine nuclear supply industry which will support the CNEA."

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BALSEIRO INSTITUTE'S ROLE IN NUCLEAR COLLABORATION FEATURED

Buenos Aires LA OPINION in Spanish 14 Feb 81 p 8

> [Excerpts] Latin American integration in the study of nuclear science. The Balseiro Institute, at San Carlos de Bariloche, has been playing an important role in this field for a quarter of a century.

But that is not the only way in which the country collaborates with nations that are relatively less developed in the nuclear field. The Balseiro Institute has been graduating students in physics since 1958 and the first nuclear engineers will come out starting in June 1981; in its classrooms, it is giving complete or specialized courses to 58 foreign students. This is a rather large number if we keep in mind that, during the first 24 years of the institution's existence--it was founded in 1955--246 persons graduated in the field of physics, of whom 114 later on completed their doctoral theses.

What is the Balseiro Institute? Created on the basis of an agreement between Cuyo University and the National Atomic Energy Commission in 1955, it is a center of higher university studies which is recognized worldwide. It is named for Dr Jose Antonio Balseiro, its first director, who died rather prematurely and to whom Argentine nuclear science owes its initial impetus. About half of its graduates completed their doctoral theses and many of them are continuing post graduate studies at research centers in Europe and the United States. Outstanding personalities from the world of science and technology have taught courses and conducted seminars at its facilities--an activity which is being revitalized dynamically and which is producing a fruitful exchange of information and opinions.

Through its continuity and coherence in the formulation and development of its plans, the National Atomic Energy Commission stands out with a well-defined profile on the national scene; likewise, the Balseiro Institute has become an exceptional thing within the Argentine university community not only because it shares the facilities of the Bariloche atomic center under CNEA [National Atomic Energy Commission] but also because of its unique study system.

Scholarship Students From Abroad

The first point to be considered here consists of the fact that, while the student body consists of just about 100, the faculty and the researchers consist of 92

members. The numerical ratio between instructors and students is one of the highest in the world--almost 1:1--and studies are being conducted as part of a system of exclusive dedication, with the students living on campus for 10 months each year.

The classroom and the laboratory are considered places of work where one can learn and debate; the main concern of the professors is to stimulate the active participation of the students. We therefore understand that, under this system, the importance of the final examination is relatively reduced; the most important thing is the result of individual and group work done throughout the course, with major emphasis on teaching of an experimental character although of course theory is not neglected either.

To be sure, this kind of teaching effort is highly expensive but the scholarship system instituted by the CNEA benefits the majority of the students. Students coming from abroad, particularly Latin America, also have scholarships from Argentina and from international organizations which appreciate the institute's teaching level.

Admission requirements are extremely stiff. It is estimated that out of 100 applicants--a number which is arrived at after various selection phases--about 30 are finally admitted; this figure is determined by the institution's teaching capacity. However, it must be emphasized that the dropout rate is one of the lowest in the country and that the CNEA guarantees a job for all graduates in its professional personnel force. In this way, the Balseiro Institute perfectly accomplishes the mission for which it was established and which can be summarized in the following two points:

Meet the demand for highly specialized experts deriving from the ever growing operations of CNEA;

Contribute to the advancement of the scientific level in the field of Argentine physics.

In addition to the nuclear physicists who have come out of its classrooms, the institution has, since 1977, been training engineers in this field, with a specific skill in tackling problems of atomic power plant development and design. It therefore awards degrees on the bachelor level in nuclear physics and nuclear engineering as well as the degree of doctor of physics and engineering, thus elevating its students to the highest level in their respective specialties.

Teaching activities are highly stimulated through the permanent interaction between the professors and the students in the course of the activities carried out, in the same building, by the Bariloche atomic center, where permanent and important research tasks are being developed. Consequently, studies revolve not only around levels of theoretical speculation but are solidly tied in with the daily work deriving from the operations plans of the CNEA.

The main efforts here cover solid-state physics--theory, metals, low temperatures, resonance--and atomic physics, neutron physics, high-energy theoretical physics,

and general physics theory. Complex and advanced disciplines among other objectives permit a valuable Argentine contribution to the continent's scientific and technological integration through the activity of foreign scholarship students. To complete theoretical instruction, the institute, in the laboratories of the Bariloche atomic center, has the Cockroft Walton, Van de Graaff, and LINAS accelerators, plus an IBM 360/44 computer.

An experimental and training reactor is currently under construction, it is called RA6 and has a capacity of 500 kw. The essential purpose is to serve as a training center for nuclear engineers being taught at the institute; it was completely designed by the experts at the CNEA and it is being built with the exclusive cooperation of Argentine firms.

The importance of the Balseiro Institute's operations can be measured by the fact that the current chairman of the CNEA, VAdm Carlos Castro Madero, studied nuclear physics there, something which he recalled on 8 August of last year when the Bariloche atomic center celebrated the first 25 years of that institution of higher learning.

During that time, the applied research program, which is being carried out in that city in the southern part of Argentina, facilitated strong interaction between its researchers and industry, as expressed through a system of contracts. Some fields, in which work is being done, include the properties of fuel elements, extractive metallurgy, advanced technologies for the electronics industry, and process simulation.

This is why Argentina, firmly committed to a task of scientific, technological, cultural, and economic integration with the rest of Latin America, has in its CNEA an instrument for cooperating in that policy which seeks to contribute to making the region independent of the international power centers which often are rather stingy in dispensing their knowledge and which want to maintain the gap that separates the industrialized nations from the rest of the countries with a relatively lower development level.

While offering its high-grade disciplines, it is also ready to receive scientific and technological contributions from other continental countries as part of a flow of horizontal transfer which will help consolidate the negotiating capacity of all of them.

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ITAMARATI DISBELIEVES REPORTED ARGENTINE A-BOMB INTENT

Sao Paulo FOLHA DE SAO PAULO in Portuguese 20 Feb 81 p 7

[Text] Raul Castro Madero, chairman of the Argentine Atomic Energy Commission, denied yesterday in Buenos Aires the report that Argentina has or is close to having an atomic bomb. The report was published yesterday in the London daily newspaper THE GUARDIAN in an article signed by its Sao Paulo correspondent, Bernardo Kucinsky, who attributed the information to a "high-ranking officer of the Brazilian Army."

In Brasilia, even before the official denial by the Argentine nuclear commission, Itamarati [Brazilian Foreign Affairs Ministry] spokesman Bernardo Pericas said the Brazilian government "does not believe the Argentine government has the intention of producing nuclear devices. The information we have is that the Argentine atomic project is for peaceful use of the atom."

Control

According to Castro Madero, "it gives the impression that the sources cited are not familiar with the processes required to extract combustible material from a nuclear power plant, which is not an easy task. Argentina, moreover, is subject to the controls of the International Atomic Energy Organization, which can verify whether or not plutonium was diverted for purposes other than the proper ones."

Acknowledging that operation of an Argentine nuclear plant is interrupted every 3 years, he explained that "this is not for the purpose of removing plutonium from it." He went on to say that the IAEA [International Atomic Energy Agency] exercises control over every plant shutdown by means of a movie camera that covers all places from or through which fuel could be extracted.

Political Decisions

According to the Kucinski article in THE GUARDIAN, the Brazilian officer told him: "We have come to the conclusion that the Argentines have a nuclear device or can test one soon, which depends only upon political decisions." The London newspaper's Brazilian informant went on to say that "we noticed in 1978 that the Argentines twice closed down operation of their first Atucha nuclear plant for 40 days. This is the period of time needed to remove the spent fuel containing plutonoum from the center of the reactor."

According to THE GUARDIAN, another source asserted that "Argentina has enough plutonium to make a bomb." It adds, without mentioning names, that "the head of the

Brazilian mission that went to Argentina in 1978, at the height of the Argentine-Chilean crisis over the Beagle Channel, returned convinced that Argentina has the bomb."

Consequences

The article in the British daily then analyzes the consequences for Brazil of the alleged Argentine atomic bomb and points out:

"The Brazilians modified their emergency plans regarding military aspects of a possible war with Argentina. Brazil does not have enough plutonium to make its own bomb and cannot remedy this situation in the short run."

The article by Bernardo Kucinski then asserts that "the assumption that Argentina has the bomb can help explain the sudden shift of Brazilian diplomacy in regard to Buenos Aires. This includes the solution of some problems and an 'atmosphere of friendship' since the recent visit of President Joao Figueiredo to Argentina."

THE GUARDIAN concludes by asserting: "Moreover, the possibility of Argentina having nuclear weapons explains insistence by the Brazilian military on accelerated development of the FRG-Brazil nuclear program."

Skepticism

In Santiago, Chile, according to FRANCE PRESS, a specialist of the Chilean nuclear energy commission expressed skepticism about the possibility of Argentina having the atomic bomb. "It does not have the raw material and even if it did, development of the bomb would violate international treaties prevailing in the hemisphere."

Argentina, however, did not ratify the Treaty of Tlatelolco, which prohibits proliferation of nuclear weapons in Latin America. Other sources in General Pinochet's regime said that these rumors about the Argentine bomb have arisen in the past, especially when tension between the two countries was heightened due to the Beagle Channel dispute.

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NUCLEBRAS STATES 1995 DEADLINE WILL BE MAINTAINED

Rio de Janeiro JORNAL DO BRASIL in Portuguese 18 Feb 81 p 19

[Text] Brasilia--"As far as NUCLEBRAS [Brazilian Nuclear Corporations] is concerned, the nuclear program has 1995 as its deadline and not the year 2000," the company's president, Ambassador Paulo Nogueira Batista, declared yesterday.

In making this statement, the ambassador contradicted Mines and Energy Minister Cesar Cals who, in an interview 20 January with a newsman in Brasilia, said the program's deadline had been extended to the year 2000. The minister reiterated this yesterday in an interview on Dutch television.

The NUCLEBRAS president asserted that as of now the company knows of no decision to delay the nuclear program--installation of nine power plants, including Angra 1, and the whole fuel cycle--for 5 years.

"As far as NUCLEBRAS is concerned, all this will be done by 1995. We have received no communication from higher authority about this further delay. If it is received, I will of course comply, but the funds are already earmarked for the program within the 1995 deadline," the ambassador said.

Angra Construction

Mr Paulo Nogueira Batista asserted that the general idea of NUCON (NUCLEBRAS Nuclear Power Plant Construction Corporation) in taking over from FURNAS [Furnas Electric Power Plants, Inc] construction of Angra 2 and Angra 3 power plants is essentially to honor all existing contracts.

Specifically in regard to the contract with Norberto Odebrecht Construction Company for executing the civil works, the ambassador said this contract will be studied because it is for administration and might not fit in with the system to be adopted by NUCON, which will guarantee price and delivery date to the concessionaires. In that case, the type of contract could be changed.

Plant Construction Begins in 1982

Construction of the two nuclear power plants on the Sao Paulo coast will not really begin until 1982. This year NUCLEBRAS will limit itself to drilling and soil studies to choose, within the area of 243 square kilometers now being expropriated, the exact site of the work.

NUCLEBRAS has decided, however, that the two new nuclear power plants will be built directly over rock, to avoid future problems with construction pilings as occurred at Angra 2 and resulted in timetable delays and cost increases.

Infrastructure

Another decision that has been taken by NUCLEBRAS is to utilize as much as possible the urban infrastructure existing in the region, such as houses, schools, hospitals, supermarkets, movie theaters and other services, expanding them when necessary. The idea is to avoid building a whole new infrastructure of services specifically for the work site, which NUCLEBRAS contends increases the costs of the nuclear plants and isolates the construction workers from the local community.

According to information from NUCLEBRAS, there will be no need to displace many property owners from the region between Peruibe and Iguape chosen for the power plants. The total area is 243 square kilometers, with 40 kilometers of shoreline, but the so-called "area of exclusion"--area near the power plants in which, by international standards of nuclear safety, there can be no resident--is only 1,500 meters.

The same international standards also require a 10 square kilometer "area of low density" around the site. But that Sao Paulo coastal region is sparsely populated and so it will probably not be necessary to displace residents from this zone.

SEMA (Special Secretariat for the Environment) and CETESB (Basic Sanitation Technology Company) technicians from Sao Paulo are monitoring the studies for exact location of the plants to arrange installation of environmental protection stations in the area.

FURNAS Offers 1,000 Technicians

As no new construction for electic power generation will begin this year due to reduction of investments in the sector, FURNAS will be able to supply 1,000 "barrageiros" (engineering specialists and other workers employed in constructing hydroelectric works) to other electric-power companies to avoid layoffs.

The problem is that most companies are in the same position. The sector's construction program is not yet entirely definite but, in principle, only ELETRONORTE [Northern Electric Power Plants] will be allowed to begin new generating construction.

Of the 8,500 FURNAS employees, about 1,200 are associated with construction of Angra 2 and Angra 3 nuclear power plants. With transfer of this work to NUCON, it is hoped that these personnel will be absorbed by the NUCLEBRAS subsidiary. Another 1,000 employees comprise the so-called "field personnel" who just finished building the Itumbiara hydroelectric plant, in the final stage of installation on the Parnaiba River. The rest are: personnel employed in constructing transmission lines, who still have to work on the Itaipu transmission system, the only FURNAS construction this year; operating personnel (the largest contingent); and support personnel.

With the possibility of supplying its "barrageiros" to other companies, FURNAS intends to avoid layoffs, if only because the company has the concession for a large

hydroelectric plant--Sao Felix on the Araguaia River, to generate 1,380 Mw--construction of which will begin as soon as funds are available. Hence, FURNAS does not want to demobilize its field personnel. There is also the possibility, according to FURNAS technicians, not yet entirely rejected, that construction will be authorized for the Salto da Divisa (480 Mw in Minas Gerais) and Itapebi (640 Mw in Bahia) power plants. The two plants will be used to make the interconnection between the Northeast and Southeast electrical syetems.

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EX-NUCLEBRAS OFFICIALS OPPOSE FRENCH THERMOELECTRIC PLANT PURCHASE

Sao Paulo O ESTADO DE SAO PAULO in Portuguese 1 Feb 81 p 47

[Article by Rio correspondent Clovis Assuncao]

[Text] Nuclear experts and former directors of the Brazilian Nuclear Corporation (NUCLEBRAS) believe that the purchase of five coal-powered thermoelectric plants in France during President Figueiredo's current trip represents one more finishing blow to the nuclear program. Those coal-powered plants represent the role that was reserved for the nuclear plants, that of technically complementing the Brazilian energy system, filling requirements for meeting peak demand. On the other hand, the announcement of the purchse of French breeder-reactor technology is nothing but a smokescreen or fantasy because there will be no point in those reactors if we do not have plutonium.

That opinion expressed by former directors of NUCLEBRAS was reinforced by the argument that the five units will have an installed power of 117 million kilowatts (350,000 KW each), practically the same as Angra-I (626 MW) and Angra-II (1,300 MW).

Costs

The experts calculated the cost per installed kilowatt for the Angra-I nuclear plant at about $2,640, representing a principal capital of $1,500 and 12 percent interest. The calculation took into account a period of 10 years and utilized the multiplier of 1.76. On the basis of that result, they indicated the great difference in price, with the coal-generated kilowatt amounting to only $800. Another positive aspect must be added: the percentage of nationally supplied components for the coal-powered thermoelectric plant is much greater.

Those experts, who are closely familiar with the difficulties of the Brazilian nuclear program, conclude that the best solution at this stage of the game, is to complete the first three plants and then stop and consider what to do, "after our capability to enrich uranium has been confirmed."

They showed that the timetables for the nuclear program are too indefinite inasmuch as Angra-I is not going to go into operation until the middle of this year, consequently, a delay of 3 years compared to the original plans. Angra-II has not yet gone beyond the foundation work, and as for Angra-III, all that is known is that some of its components are being produced by the NUCLEBRAS Heavy Equipment Corporation (NUCLEP). In the opinion of the former NUCLEBRAS officials, that

industry will stay "in the red" for a long period of time, with an idle capacity difficult to overcome, and it will "not get out of the red for several decades." It cost $300 million and is the largest heavy equipment factory in Latin America.

The experts who worked for NUCLEBRAS said that the fuel cycle, of fundamental importance to the nuclear program, is at square zero. The uranium enrichment pilot plant has 456 stages and, according to its schedule of activity, the first cascade with 24 stages, representing 5 percent of the total number of stages, is supposed to ge completed in 1982.

To achieve those results (the tail-end of the cascade), the costs were calculated 2 years ago at $282 million by 1982; but with the correction of the dollar, in accordance with the financial agreements of the nuclear program, it is much higher today. The former officials of NUCLEBRAS point out that "all of that is just to demonstrate if the thing is suitable, if it is going to work," even though this first cascade is going to drag on for another 3 years. Out of NUCLEBRAS' 95 billion cruzeiro budget, only 5 billion cruzeiros have been allocated for the fuel cycle.

After the first cascade has been completed, it will take another 6 months to evaluate whether to proceed or halt the German-patented ("jet-nozzle") centrifugal jet process for the enrichment of uranium.

Promise

The same experts said that they read with "attention and surprise" press reports about the negotiations of Brazilian officials in France with a view to our utilizing rapid-breeder reactors. They explained that is nothing more than a "beautiful promise because we would be going back to an unbelievable vicious circle." The rapid-breeder reactors operate only with plutonium, which is obtained as the spent (U-238) fuel from the reactors of the type being built in Brazil.

The former directors of NUCLEBRAS observe that the plutonium could be obtained when the first three Brazilian nuclear plants are operating at full power; but production can only be developed with the plutonium or reprocessing plant, the site of which has not even been decided.

In view of that situation, the experts raised another question: since we do not have plutonium, who is going to sell it to us? France? If it were to do so, it would demand safeguards as a result of the pressures it would be subjected to because it is the element used to produce nuclear devices. Urenco would inevitably create all sorts of difficulties and then there would begin endless discussions and perhaps the conclusion of agreements detrimental to national interests, with new dependency.

These informants called attention to the fact that the roster of former employees of NUCLEBRAS is going to increase in 2 weeks. The director of the NUCLEBRAS Isotope Enrichment Corporation (NUCLEI), Engineer Luis Rousset Velho, presented his resignation because of differences over bids with Ambassador Paulo Nogueira Batista, the president of NUCLEBRAS. The experts reported also that Admiral Hugo Friedch Shieck Junior, replaced 3 months ago as director of the Rio de Janeiro Navyyard by Vice Admiral Rafael de Azevedo Branco, has already been offered and has accepted the position.

In recent years, professionals of outstanding reputation among the country's technical and scientific circles have quit or were fired for disagreeing with Paulo Nogueira Batista's methods of action or with the privileges granted the Germans by the nuclear agreement.

Mentioned among those individuals are: David Simon, Sergio Salvo de Brito and Joaquim de Carvalho, of NUCLEN; Dirceu Lacerda Coutinho (replaced by Luiz Velho); Carlos Syllus Martins lost the position of director-superintendent and was given a lower position within NUCLEBRAS; Eduardo Calmon, Vicente Costa e Silva and Hercules Dutra, of NUCLEBRAS, all former directors dismissed as a result of crises in the company. They disagreed with the policy line of Ambassador Paulo Nogueira Batista, especially in connection with the complete secrecy (even from the directors) attached to certain documents, such as the Brasilia and Bonn protocols, registered and of public record in the German archives.

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NUCLEBRAS EXPLAINS FRENCH-BRAZILIAN COOPERATION

NUCLEBRAS President in Bonn

Rio de Janeiro JORNAL DO BRASIL in Portuguese 3 Feb 81 p 15

[Dispatch by Bonn correspondent William Waack]

[Text] Nuclear cooperation between France and Brazil following Figueiredo's trip to Paris was one of the main topics that the president of the Brazilian Nuclear Corporation (NUCLEBRAS), Paulo Nogueira Batista, dealt with yesterday with representatives of the German Government. Nogueira Batista began his 4-day stay in Germany by meeting yesterday for the first time with the new German minister of research and technology, Andreas von Buelow, who assumed that position only 2 months ago.

The president of NUCLEBRAS spent almost 1 hour explaining to the new German minister--the third to occupy the technology ministry since the signing of the agreement in 1975--the principal aspects of the Brazilian-German agreement. Andreas von Buelow, who was parliamentary secretary of state in the Defense Ministry until the reshuffle of the German cabinet in November, has not yet had enough time to familiarize himself with the Brazilian-German agreement and the questions he addressed to Nogueira Batista were of a general nature, beginning with the type of enrichment technology Brazil is developing in cooperation with the Germans.

Things were different with secretary of State Hans Hilger Haunschild, who has been coordinating the nuclear agreement for the German side since the first stages of its negotiation in 1974. Nogueira Batista and Haunschild had lunch together yesterday in a contact that both described as "absolutely normal and routine."

The main thing the German side was curious about pertained to the aspects of cooperation between Brazil and France and, principally, to the plans for operation of the new NUCLEBRAS subsidiary, the NUCLEBRAS Nuclear Plant Construction Corporation (NUCON). A German source said yesterday in a precautionary way "that Bonn has nothing against nuclear cooperation between Brazil and France, which is being viewed with excellent good will." In the opinion of the Germans, France has every right to participate in aspects of the nuclear program in which the Germans are not very active, as is the case of uranium hexafluoride (Figueiredo intensified the existing cooperation in that field with the French).

"It is obvious that the French would also like to enter into the light-water reactor projects in some way but the contracts between Brazil and Germany in that area were signed in such a way that there is no longer any room for third parties," declared the same German source.

The president of NUCLEBRAS told the Germans that all the decrees have already been signed and that NUCON will begin to work shortly. According to information from the Brazilian and German sides, the delays in the Brazilian nuclear program are being viewed matter of factly in Bonn, the nuclear program of which is also completely off its original timetable.

Five-Year Delay Envisaged

Rio de Janeiro JORNAL DO BRASIL in Portuguese 11 Feb 81 p 17

[Excerpts] Salvador--Technical and economic difficulties are going to bring about a 5-year delay for completion of the first stage of the Brazilian-German nuclear agreement, originally envisaged for 1990. The prediction was made yesterday by the ambassador of the Federal Republic of Germany, Franz-Joachim Schoeller, at a luncheon on the first Brazilian plants.

In the opinion of Schoeller, the agreement continues to go "very well" and, except for the timetable, everything will continue to go according to the original terms, according to discussions held with the Brazilian Government. The German ambassador emphasized that all experts consider that in projects of this magnitude "there is always a variation of time; the timetable can never be met."

In the opinion of Franz-Joachim Schoeller, the recent visit by President Figueiredo to France showed that the French want to restore the lagging trade relations with Brazil. And that, in his view, is positive also for Germany because it will expand the Brazilian-European connecting bridge.

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NUCLEBRAS EXPROPRIATES LAND FOR PLANT SITES IN SAO PAULO

Rio de Janeiro GAZETA MERCANTIL in Portuguese 11 Feb 81 p 17

[Text] The Brazilian Nuclear Corporation (NUCLEBRAS) proposed 72 land expropriation actions in the Sao Paulo municipality of Peruibe, where the recently created subsidiary of that company, the NUCLEBRAS Nuclear Plant Construction Corporation (NUCON), is going to build the Peruibe-I and II nuclear plants. The amount to be paid for the land is estimated at about 30 million cruzeiros. Last week, the federal court granted NUCLEBRAS provisional access to take possession and the company is only waiting for the publication of the decision in the DIARIO OFICIAL to deposit the 30 million cruzeiros.

The process of expropriation of the site of the two new plants involves seven land jurisdictions and 14 judges. For that reason, NUCLEBRAS believes that it will still take time before it will be able to take definitive possession of the land. As soon as the judges grant definitive access to take possession, the company plans to get all the property owners together to effect the purchase. Only after that will it begin to make the detailed site studies to determine on which beach the two nuclear plants will be installed.

New Orders

By next month, the NUCLEBRAS Engineering Corporation (NUCLEN) is going to place the first part of the orders for national equipment for the Angra-II nuclear plant envisaged for this year. It will be the equipment listed in the market guarantee protocol signed in 1976 with the Confab, Cobrasma and Bardella industries the contracts of which have already been delayed twice because of delays in the civil works of the plant.

According to the protocol, the three Sao Paulo industries received the guarantee that they will manufacture the principal national equipment for Angra-II and III and for the two following plants on the Sao Paulo coast. But, so far, only two of them have received orders: Confab, which is building the containment vessel for the Angra-II reactor, and Cobrasma, which at the end of last year contracted with Furnas to supply 36 heat exchangers for Angra-II and III, worth 1 billion cruzeiros.

That, by the way, was the last contract for nuclear equipment placed by Furnas. Henceforth, the orders will be placed directly by NUCLEBRAS, since its subsidiary, NUCON, will assume construction of the plants.

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LACK OF URANIUM MAKES NUCLEAR SUB CONSTRUCTION UNFEASIBLE

Rio de Janeiro JORNAL DO BRASIL in Portuguese 30 Jan 81 p 16

[Text] Brasilia--The major problem for Brazil in building a nuclear submarine is getting enriched uranium, declared the vice chief of the Armed Forces General Staff (EMFA), Admiral Ibsen de Gusmao Camara, yesterday. In his opinion, the country is not in a position to produce it at the present time; it knows how to build it.

The Brazilian nuclear agreement does not permit the use of the uranium we produce for military purposes; the treaty is for peaceful purposes. But there is no extraordinary secret about the construction of a nuclear submarine. Theoretically, we know how to build it, the same way that we know how to make an atomic bomb.

Twenty Years

He pointed out that, depending on the effort Brazil expends in that technology, a nuclear submarine could be produced within 20 years, provided that simultaneously with the enrichment of the uranium that it uses, the country would make an effort to produce more. "I could say, in the same way, that it could produce that submarine in 5, 10 or 15 years. That only depends on our efforts and the funds available to us."

In March, Admiral Ibsen de Gusmao will accompany the minister-chief of the EMFA, General Jose Ferraz da Rocha, in the first military visit to the United States following the inauguration of President Ronald Reagan. The invitation was extended by the U.S. Defense Ministry and the purpose is to maintain the relationship between the two armed forces.

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TITANIUM, NIOBIUM RESERVES REPORTED LARGEST IN WORLD

Rio de Janeiro GAZETA MERCANTIL in Portuguese 4 Feb 81 p 10

[Article by Rio correspondent Sergio Danilo]

[Text] Seven of the 10 most valuable minerals in the world are abundant in Brazilian territory. Except for gold, copper and lead, Brazil ranks from first to seventh places in reserves of niobium, titanium, iron, bauxite, manganese, chromite and tin. That conclusion was reached by experts of the Mineral Technology Division of the National Scientific and Technological Development Council (CNPq) which, headed by the geologist Helena Maria Lastres, completed a study on the preformance of the Brazilian mineral sector and on world mineral reserves.

According to statistics from the "Commission des Communautes Europeennes," the source of the research, world reserves of mineral resources are distributed as follows: 43 percent among capitalist developed countries; 32 percent among developing countries; and 25 percent among socialist countries.

Brazil ranks first in niobium, with 76.7 percent of world reserves; followed by the USSR, with 6.4 percent; Canada, 5.5 percent; Zaire, 3.8 percent; Uganda, 3.0 percent; and Nigeria, 3 percent. As of 1978, world niobium reserves were estimated at 21 million tons.

Brazilian titanium (Anastasio) reserves are also the largest in the world, with 23.2 percent; followed by Canada, 18.7 percent; India, 16.3 percent; Norway, 15.2 percent; Australia, 8.4 percent; and the United States, 7.4 percent. Brazil ranks second in iron reserves, with 17.5 percent; while the Soviet Union today has 30.2 percent; Canada, 11.7 percent; Australia, 11.5 percent; and India, 5.8 percent. According to the CNPq study, Brazil today has reserves in excess of 33 billion tons of iron, with the Carajas range accounting for 20 billion tons and the remainder being distributed among Minas Gerais, Mato Grosso, Parana, Pernambuco and Bahia.

With regard to bauxite, Brazil today has 10.3 percent of world reserves; that is, it ranks third in the world. A recent study by Docegeo estimates that Brazil has 4.5 billion tons of bauxite, 2 billion tons of which are under the control of the Vale do Rio Doce Company (CRVD). Guinea has 33.9 percent and Australia, 18.6 percent of world reserves; India has 5.8 percent; Guiana, 4.1 percent; and the Republic of the Camaroons, 4.1 percent.

In 1979, Brazil had 71,575 tons of tin, contained in cassiterite, ranking seventh in world reserves of that mineral, with 5.9 percent. First place is held by Indonesia, with 23.6 percent.

Despite the depletion of the Navio Range reserves in Amapa and the abundance of manganese in the region of Corumba, Mato Grosso, Brazil ranks fourth in reserves of that mineral, with 2.2 percent. The CNPq study also shows Brazil to rank sixth in chromite reserves, with 0.3 percent. The Republic of South Africa ranks first in chromite, with 74.1 percent of world reserves.

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IAEA EXPERT URGES URANIUM EXPORT SALES; NUCLEBRAS REPLIES

Rio de Janeiro GAZETA MERCANTIL in Portuguese 13 Feb 81 p 7

[Text] Sao Paulo--"Brazil should make an effort to export its surplus uranium as soon as possible." That is, in brief, the message of Brazilian geologist Paulo Barreto, for 6 years a member of the nuclear fuel cycle division of the International Atomic Energy Agency (AIEN [IAEA]) in Vienna.

Barreto, also a professor at USP [Sao Paulo University] and the Astronomy and Geophysics Institute and a National Nuclear Energy Commission (CNEN) specialist, spoke the day before yesterday at the Institute of Engineering about the availability of and demand for nuclear fuels from 1980 through the year 2000. Exhibiting charts and graphs from the INFCE [expansion unknown] and the IAEA, he based his recommendation for exporting uranium on their market statistics.

These figures show that today's price of uranium is depressed (1 kilogram is worth 1/3 of the $120 quoted in 1976). Production exceeds world demand by about 15,000 tons per year. Nevertheless, asserts Barreto: "That picture will be reversed and the shortage of uranium will be comparable to that of petroleum; quite probably a cartel--an OUEC [Organization of Uranium Exporting Countries]--similar to OPEC will be formed for the nuclear energy ingredient."

The IAEA specialist points out that an average of 15 years elapses from prospecting to mining and processing of uranium. Hence, he suggests urgent measures and investments by Brazil, "whose reserves are enough for 30 nuclear-power plants, for having a strategic stockpile for 100 percent of its needs and for exporting surpluses."

Reserves

NUCLEBRAS [Brazilian Nuclear Corporations] data show that Brazil's uranium reserves rose from 63,000 tons in 1977 to 236,000 now. But Barreto is expecting even more from Brazilian geological conditions: "The very conditions that preclude the presence of petroleum in Brazil indicate that of uranium. The nation's potential reserves as of now are in the range of 500,000 to 1 million tons." He also brings to mind that for each kilogram of uranium Brazil is presumed to have 4 kilograms of thorium. So, he says, "the Thorium Group can safely be reconstituted in this country and will not have to start from scratch."

Another argument presented by the speaker is that "uranium can only be used as nuclear fuel (or pigment). If Brazil does not take advantage of the current nuclear

technological cycle, its thousands of tons of ore will lose their value [illegible]. By then nuclear fusion (based upon hydrogen), fast-breeding reactors and the plutonium-thorium cycle will completely dilute the commercial value of uranium."

Surplus

Africa, Australia, Brazil and Argentina together tend to export surplus, according to the IAEA. Europe is poor in uranium and will have to import it. The United States will not produce 34,000 tons until 1985; it is now producing 20,000 tons per year. Canada will produce another 28,000 tons (it is now producing 14,000 tons per year), but a good part of it is already contracted for. "South Africa, Zambia, Nigeria, Gabon, Namibia and other African countries will increase supply, many of them either without domestic programs for using it in reactors or with clear ideological preferences in their choice of clients," Paulo Barreto declared.

"Hence, from 1990 on, bearing in mind the measured, implied and estimated reserves, a significant gap between uranium supply and demand will emerge. The most worried consumers--Italy, France, Japan, Great Britain, FRG and others--are already mining and participating in prospecting in developing countries. In Brazil, the FRG owns 25 percent of NUCLAM [NUCLEBRAS Mining Assistance, Inc]," he explained.

And further: "Each reactor, with a useful life of 25 to 30 years, is installed with contractually guaranteed supplies for its entire life. In a few years we will see a worldwide race by consumers trying to sign such contracts, as there will be a uranium shortage," he said.

Whether or not this shortage will be reduced by extracting uranium from phosphate deposits depends upon a future technological advance. But Paulo Barreto's IAEA forecasts include the uranium contained in phosphate.

NUCLEBRAS Favors Consumption

"The uranium development program in Brazil is directed toward seeking and discovering new deposits of this mineral, its production and supply of Brazilian nuclear power plants. NUCLEBRAS is not thinking of exporting its uranium stocks," NUCLEBRAS director John Forman announced in Rio de Janeiro yesterday.

Brazil, according to Forman, has the world's fifth largest uranium reserve (236,000 tons), enough to meet all the program's needs. "We must produce uranium 'in natura' to produce plutonium in the future," he said.

He is of the opinion that Brazil does not need to participate in an association of uranium exporters, of the Club of London type, because "the nation is on the right road," producing uranium in order to enrich it in the future.

Unofficially, it is known in the nuclear sector in Rio de Janeiro that Brazil's uranium reserves are worth at least $16 billion as "yellow cake" [concentrated uranium oxide] and, if transformed into enriched uranium, would be worth $40 billion.

To enrich uranium, NUCLEBRAS is investing $65 million in a plant for making uranium hexafluoride, a gas needed in the process. The plant is being built in Resende, Rio de Janeiro State, and its initial capacity will be 500 tons per year, expandable

to 2,000. The Resende unit will absorb yellow cake produced by NUCLEBRAS in Pocos de Caldas since 16 January and in other mines being developed by the company. The technology for producing uranium hexafluoride is from the French firm Pchiney Ulgine Kulman, which is also giving NUCLEBRAS technical assistance in producing yellow cake.

9834
CSO: 5100

PERUIBE 1, 2 CONSTRUCTION TO BEGIN ON SAO PAULO COAST IN 1982

Sao Paulo FOLHA DE SAO PAULO in Portuguese 22 Feb 81 p 39

[Text] Rio de Janeiro--Construction of the Peruibe 1 and 2 nuclear power plants on the Sao Paulo coast will begin in 1982, with a 1 and 1/2 year lag in the timetables of the two units, asserted Paulo Nogueira Batista, NUCLEBRAS [Brazilian Nuclear Corporations] president, yesterday. He was accompanied by the chief of the National Intelligence Service, Gen Otavio Medeiros, after commemoration of Brazilian victories in Italy during World War II.

Nogueira Batista said the legal proceedings for expropriating land have been concluded and field-engineering studies will now begin to determine the exact location of the nuclear power plants, which will be built on solid rock to avoid the foundation problems that occurred at Angra 2.

On 4 June last year President Joao Batista Figueiredo signed a decree locating construction of two more nuclear power plants on the southern coast of Sao Paulo between Iguape and Peruibe. The decree authorized expropriation of 23,000 hectares and at that time it was stated that CESP (Sao Paulo Electric Company) would be responsible for building the two plants.

The presidential decision was condemned at that time by the Brazilian Society for the Advancement of Science and the Federation of Associations of Agronomy Engineers of Brazil, by members of several ecology movements and professional associations, which conducted demonstrations and other protest activities. The population of Peruibe and Iguape was horrified by the government decision and also conducted protests against locating the nuclear plants in their municipalities.

During that same month of June 1980 FOLHA DE SAO PAULO launched a campaign entitled "Does Sao Paulo Need Nuclear Power Plants?" so that all sectors of the population could express themselves on the subject. Other voices against expanding the Brazilian Nuclear Program were not lacking. Prof Rogerio Cesar de Cerqueira Leite of Campinas University (UNICAMP) reiterated at that time his criticism of the Brazil-FRG nuclear agreement. "The agreement," he said, "was an excellent transaction for the FRG nuclear industry. One need but recall that the last reactor ordered in the FRG was in 1976. Brazil was the only nincompoop to appear in this story."

Transfer to NUCON

The NUCLEBRAS president also revealed that he is waiting only for instructions from the government to begin negotiations to transfer construction of Angra 2 and 3

nuclear power plants from Furnas Electric Power Companies [FURNAS] to NUCON [NUCLEBRAS Nuclear Power Plant Construction Corporation], which should occur next week. He mentioned he had talked to ELETROBRAS [Brazilian Electric Power Companies, Inc] President Gen Jose Costa Cavalcanti and "everything is all right."

According to Nogueira Batista, transfer of nuclear construction, including all foreign contracts, will not involve more expenses. "On the contrary, we hope to reduce them," he said. The whole transfer process will be completed within 4 months and FURNAS will be reimbursed for investments made in construction by that time, as it does not have funds in its budget for Angra 2 and 3 nuclear plants.

As for the NUCLEBRAS debt of 2.8 billion cruzeiros for unpaid bills from contractors and suppliers, Nogueira Batista said payment will depend upon release of funds from the government. The company's foreign debt is now $400 million, which is less than 1 percent of the nation's foreign debt. "Hence," he said, "they cannot accuse NUCLEBRAS of being one of those most responsible for the foreign debt."

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BRIEFS

NUCLEBRAS TRAINING IN PARIS--Rio--Eight Brazilian Nuclear Corporation (NUCLEBRAS) technicians have been in Paris since 26 January assimilating the technology necessary for operation of the uranium hexaflouride factory which Pechiney Ugine Kuhlman is building in Resende, Rio de Janeiro, "one of the most modern in the world," according to the director of Pechiney in Brazil, Pedro Caminha. The Uranium hexafluoride will produce the gas for enrichment of the uranium utilized in the nuclear reactors to be installed in Brazil. In addition, Caminha added that Pechiney is providing technical assistance to the NUCLEBRAS plant for the beneficiation of uranium and the production of yellow-cake in Pocos de Caldas, Minas Gerais. NUCLEBRAS has been producing that mineral in that plant since 16 January. Caminha reported also that Pechiney is going to invest $1 million this year in chromite exploration in the whole Piuim region, east of Minas Gerais. The company has already explored for that mineral in the Jacobina, Bahia, area, and still holds the exploration permit for that region. [Rio de Janeiro GAZETA MERCANTIL in Portuguese 11 Feb 81 p 1]

SUPPORT FOR PORTUGUESE PROGRAM--Lisban--Brazil will provide support for the Portuguese nuclear energy program within the context of scientific and technological cooperation established between the two countries. President Joao Figueriedo made this promise to President Ramalho Eanes during the 1-hour meeting they held in Belem Palace before the private luncheon they had in Fort Sao Juliao da Barra, one of Eanes' summer residences. The talks transpired in an "extremely cordial" atmosphere without protocol and with a "broad exchange of views," The presidents exchanged decorations and presents and manifested an identity of viewpoints on such topics as the African issue--on behalf of speeding up the independence of Namibia--Afghanistan and the membership of Portugal in the EEC, considered significant for Brazilian interests in the continent. [Rio de Janeiro JORNAL DO BRASIL in Portuguese 3 Feb 81 p 4]

NUCON SUPERINTENDENT--Rio--The first superintendent of the Angra-I nuclear plant project, who is currently working in private enterprise, Engineer Emilio Leme, was named yesterday director-superintendent of NUCON, the NUCLEBRAS subsidiary charged with building nuclear plants. Engineer Alberto Amaral Sosorio was named to assume the commercial and financial directorate, and the administrative board will be comprised of: Ney Freire de Oliveira Jr., current director of the fuel cycle area; Colonel Sebastiao Valadao, planning superintendent; and Leo Nunes da Silva. The supervisory board is comprised of Paulo Roberto Saraiva da Costa Leite, Antonio Felicio Dias and Jose Milton Soares Dallari. [Sao Paulo FOLHA DE SAO PAULO IN Portuguese 30 Jan 81 p 35]

CALS DEFENSE OF PROGRAM--"Anyone who criticizes our nuclear program is thinking about Brazil of today and not Brazil of the year 2000," Mines and Energy Minister Cesar Cals said yesterday in Cuiaba in refuting accusations, mainly by businessmen, that the nation is investing fabulous sums of money in this sophisticated form of energy in detriment to other sources that in the short or medium run could represent self-sufficiency for the nation in the energy sector. The minister, AGENCIA GLOBO reports, insisted that "in spite of all the funds it has to achieve self-sufficiency in this sector, Brazil must master the technology of coal and nuclear energy, including planning, building and operating the sophisticated equipment for its production." Cals says that within 20 years Brazil must be able to develop the program by itself--from mining and enrichment to reprocessing uranium. Cals denied there is a shortage of funds to invest in other energy sources "and, rather, guarantees" for obtaining them. The minister remarked that Brazil has large coal reserves, and a potential for 100 million kilowatts in the Amazon region water resources. But he also pointed out that energy consumption increased 12 percent per year nationally. "For this reason, whoever criticizes the nuclear program forgets we must think about Brazil in the year 2000." [Excerpt] [Rio de Janeiro GAZETA MERCANTIL in Portuguese 20 Feb 81 p 9] 8834

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BRIEFS

'BIGGEST' URANIUM DEPOSIT FOUND--Oaxaca, Oaxaca, 9 Mar (NOTIMEX)--The government-controlled Mexican Uranium (URAMEX) enterprise has reported that it has found the biggest uranium deposit in the country in Santa Catarina Tayata, Tlaxiaco region (500 km southeast of Mexico City), with an estimated reserve of 10,000 tons. URAMEX Director Francisco Vizcaino Murray said that exploitation will begin in June with an investment of 650-million pesos ($28.2 million). Over $130 million is being invested at present in the exploration and exploitation of uranium in the states of Chihuahua, Nuevo Leon, Tamaulipas, Sonora (northern Mexico) and Oaxaca. [Excerpt] [FL092250 Mexico City NOTIMEX in Spanish 1940 GMT 9 Mar 81]

CSO: 5100

FINANCING OF FAST BREEDER REACTOR ENDANGERED

Frankfurt/Main FRANKFURTER ALLGEMEINE in German 9 Feb 81 p 11

[Article by K.B.: "Will the Fast Breeder Become a Construction Ruin? Increasingly Great Financing Difficulties; New Cost Estimate for Kalkar: DM 5.6 Billion"]

[Text] Bonn, 8 February--The financing difficulties for the fast breeder reactor at Kalkar on the Lower Rhine are becoming more and more serious. The Federal Research Ministry now estimates the construction costs at DM 5.6 billion. Up to now, Research Minister von Buelow had calculated on DM 5.2 billion. According to the most recent estimate, Bonn's doubts are growing as to whether it will be possible to finance the fast breeder reactor at all. Negotiations are to take place this week between von Buelow and the Rhine-Westphalian Electricity Works Inc (RWE) regarding the financing.

Von Buelow expects that this, the largest German public utility, will increase its financial share in the fast breeder reactor from the previous approximately 7 percent. However, the board of directors of this enterprise has already announced (FRANKFURTER ALLGEMEINE 10 January) that it is not prepared to make a substantially larger contribution. By now, the investments have reportedly reached such proportions, that even the Rhine-Westphalian Electricity Works would be financially overtaxed.

Against the background of these financial difficulties, the Federal Government and the fractions are apparently now preparing once more to ask the question of whether breeder technology makes any sense. Experts believe that economic utilization of the fast breeder may in any case not be possible until the next century. In Bonn they are already examining how the Kalkar complex could be used for other research and development purposes in energy production. On the other hand, the defenders of the fast breeder reactor are asking with a great deal of concern whether the energy-short FRG could do without a development which could better utilize the uranium resources. Bonn would also have to justify it to the taxpayers if the construction in Kalkar were to become a total loss. Warnings are also being issued that the FRG should not make itself totally dependent on French breeder technology as a licensee, although Paris has pledged to let the German nuclear energy industry share in this technology. This is substantiated with the RWE's participation in the French Super Phenix breeder reactor, as well as with the close German-French nuclear cooperation.

The order for the prototype in Kalkar was originally placed at a contractual price of DM 1.7 billion. In the 1981 budget proposal the costs are still indicated as 4.083 billion. Compared with the most recent estimate, the gap in financing amounts to more than DM 1.5 billion. Up to now the costs have been apportioned as follows: DM 333 million for investment allowance, liabilities to the Federal Government 2.4 billion, to the power industry DM 289 million, to the nuclear energy industry DM 28 million and to the Dutch-Belgian partner 1.02 billion. The governments in Brussels and the Hague have let the Federal Government know that they are not prepared to increase their share.

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COURT SUSPENDS CONSTRUCTION OF THORIUM REACTOR

Frankfurt/Main FRANKFURTER ALLGEMEINE in German 17 Feb 81 p 4

[Text] Duesseldorf, 16 February--Since Monday a construction ban has been in effect for the thorium high-temperature reactor near Hamm. The administrative court in Arnsberg ordered the immediate cessation of all work on the feed water building of the 300-megawatt nuclear power plant in response to the petition of a building contractor who is a member of a citizens' initiative against the reactor. Construction of the reactor is being urged by the Rau government in Duesseldorf principally for its future importance for coal processing in the Ruhr area. The operators of the power station, in which DM 1.4 billion of a total cost of about DM 2.4 billion have already been invested, and the Land government as the authority granting approval intend to appeal the latest decision to the upper administrative court in Muenster.

The new partial ban on construction, which will lead to losses of about DM 20 million each month because of these repeated delays, according to the companies involved, had been expected after the chamber in Arnsberg had last week, in the same proceedings, declared the fourth of a total of nine partial construction permits to be invalid, permits issued by the pertinent ministry of labor in Duesseldorf.

The chamber is arguing that the fundamental rights of the plaintiff to life, physical inviolability and freedom of person have been materially damaged because the constructional lines of this type of reactor have been constantly changed in recent years without hearings for those nearby residents affected. The Arnsberg decision follows the principles established by the Constitutional Court in 1979 in the dispute concerning the reactor in Muelheim-Kaerlich. The Arnsberg chamber emphasized that it did not have to decide whether the use of nuclear energy should be continued or not, nor how the complex regulations of the nuclear law protecting the individual citizen were to be modified. This was a matter for the legislature and not for the judiciary. The high-temperature reactor has been under construction since 1972 and was supposed to be completed, according to previous plans, in 1984. Since the partial ban on construction must be put into effect immediately, further delays with rising costs because of the legal appeals cannot be avoided. This will have an effect on electricity prices in the eastern Ruhr and Westphalia, which have been rising at an increasing pace recently.

9581
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FALLOUT FROM PRC NUCLEAR EXPLOSION DETECTED

Naples IL MATTINO in Italian 12 Feb 81 p 19

[Article by Michele De Simone and Pietro Lombardo: "(Atomic) China Is Close at Hand"]

[Text] Sessa Aurunca--Radioactivity is also raining down on the Garigliano Plain from the People's Republic of China. This information is contained in a report sent by the National Nuclear Energy Commission [CNEN] to the General Directorate for Civil Defense [DGPC], the Higher Institute of Health, the Campania and Latium assessorships, the Caserta and Latina prefects and the mayors of Sessa Aurunca and Castelforte.

"The gamma spectrometry measurements performed on the water samples," according to the exact wording of the report on measurements of samples taken on 5 December near the Garigliano power plant after the opening of a few underground sites in November, "revealed no radioactive contamination of any kind, whereas, in the case of the beets, we found extremely high levels of radionuclei coming from the fallout which occurred during those few days and which were traceable to the Chinese atomic bomb exploded on 16 October 1980.

"This conclusion," the report continues, "is confirmed by the nature of the radionuclei which is characteristic of fallout; such contamination has also been found in other samples analyzed during the same period in various parts of Italy."

The investigation of the "yellow" radionuclei--still within acceptable limits--was made by CNEN's staff (Belli, Boeri, D'Amato, Paganelli, Sacripanti) who prepared the official report after completing the analysis. "Water, infiltrating the walls and pavement of the site, presumably picked up the radioactive contaminating elements in solution," the report continues, "without involving the storage tanks or their contents (resins and concentrates from the evaporator (editor's note). In seeping down through the stratum, some of the water flowed out into the open. In order to make sure that the radioactivity thus released (cesium 137 and 134 and cobalt 60) had had no effect on the environment and for other health reasons, ENEL [National Electric Power Agency] was asked to make tests on water samples taken from that stratum."

The sampling of the water, coordinated by CNEN technicians (Environmental Protection Division) with Engineer Vitiello, the power plant's manager, and Professor Tipaldi of Formia health unit number 6, was carried out on four specimens: two to

the northeast and southwest of the deposit which had been infiltrated and two near the Santa Lucia and via Larga farms.

In addition, a sampling was made of edible plants, in this case beets, on the Latium slope downstream from the power plant. Measurements made in the laboratory on any radioactivity involved in the samples analyzed confirmed the absence of cesium 137 and 134 and cobalt 60.

In a letter accompanying the technical report, Engineer Naschi, principal director of CNEN's nuclear safety and health protection department, asserts that "in all water samples analyzed, both in shafts within the power plant's terrain and externally, no traces of artificial radioactivity were found." However, he goes on to say that "further analyses are currently being made by CNEN on water samples taken from the stratum, shafts being excavated when necessary."

He concludes by stating that "as soon as the latest results are available, a final report will be prepared containing all available information and will be sent to all interested parties."

Meanwhile, Dr Artemisio, Sessa Aurunca magistrate, is continuing to take action. Following up a judicial communique sent a few days ago, he met with the power plant's director, Eng Tommaso Vitiello. The judicial action taken by the magistrate on this complex problem is obviously aimed at having a thorough investigation made on the causes and formalities involved in the event which occurred last November, a few days before the earthquake, when the waters of the Garigliano River flooded the site of the electronuclear installation and, upon re-entering the riverbed, deposited radioactive material.

From the report sent by CNEN experts a few days ago, there is obviously an absence of artificial radioactivity.

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BRIEFS

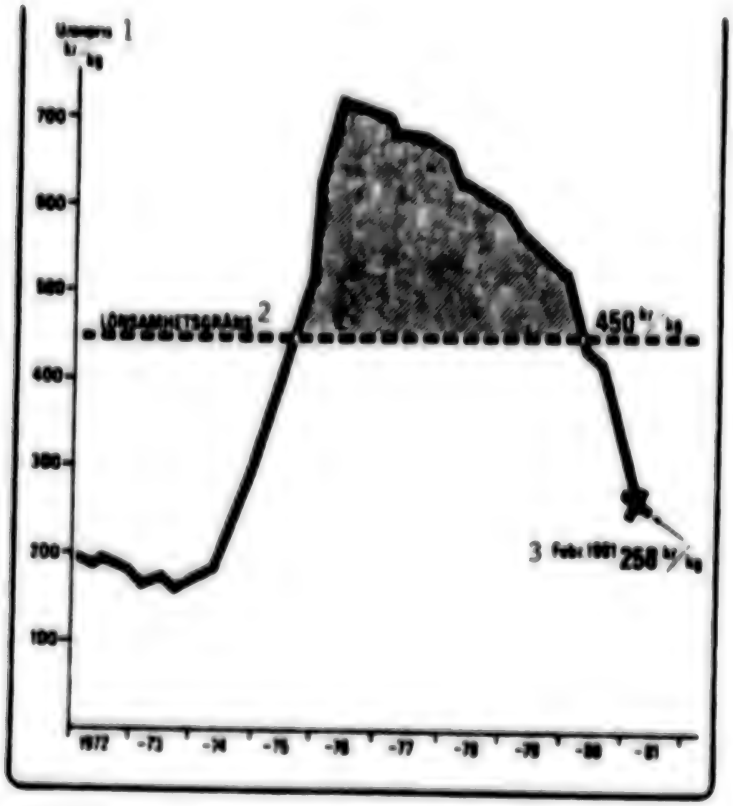
NUCLEAR POWER LOBBY FORMED--The Norwegian Nuclear Power Society has been formed by a number of private persons interested in nuclear technology development and application in Norway. In a press statement it says that one of the most important objectives of the society will be to disseminate accurate and serious information on the advantages of nuclear power, and to work to create support in Norway for peaceful application of nuclear energy. [Text] [Oslo AFTENPOSTEN in Norwegian 12 Feb 81 p 15]

CSO: 5100

FALL OF WORLD URANIUM PRICES THREATENS MINE PROFITABILITY

Stockholm DAGENS NYHETER in Swedish 18 Feb 81 p 8

[Article by Bo G. Andersson]



[Text] Are Swedish nuclear fuel companies, headed by Swedish Nuclear Fuel Supplies (SKBF), prepared to pay more for Swedish uranium from Pleutajokk than they would have to pay on the world market? This question is highlighted by the very low uranium prices on the world market. There has been a dramatic decline in recent years. The price has been around 260 kronor per kg of uranium oxide in the last few days. For the LKAB Mining Company project outside Arjeplog to be profitable the firm must get 450 kronor per kilogram.

Key: 1. Uranium price kronor/kg 2. Profitability line 3. February price

The LKAB Mining Company's uranium project in Pleutajokk outside Arjeplog could be a losing proposition with losses running in the tens of millions a year.

The reason is that the already low uranium prices on the world market are continuing to fall. The spot market prices for the last few days have been about 260 kronor per kilogram of uranium oxide compared with over 700 kronor in the mid-1970's.

The LKAB mining application which was presented to the government in December estimated an annual mining rate of around 450 tons of uranium at Pleutajokk. Production costs are estimated at around 200 million kronor.

For the firm to get a reasonable return in addition to covering expenses these figures mean that it must get 450 kronor for each kilogram of uranium oxide extracted. That is the profitability limit of the uranium project (see diagram), a figure the firm itself makes use of.

Loss Risk

If LKAB cannot get a higher price than the spot market price (currently 260 kronor per kg of uranium) and the low prices continue during the 1980's, annual losses could be roughly 80-90 million kronor.

Erik Svenke, head of Swedish Nuclear Fuel Supplies, SKBF, said that his firm cannot pay excessively high prices just to get Swedish uranium.

"We have an indirect responsibility to all the electricity consumers in the country. Prices for nuclear electricity must not be too high," said Svenke. "But we would be willing to pay a little more, partly because of the supply guarantee involved in mining inside our own borders."

Erik Svenke said SKBF could handle a surcharge of "several percentage points at most" in the purchasing agreement the firm will sign with LKAB if mining gets under way.

He was not comparing this price with the spot market price but with a constructed "average price" of agreements in the long-term contracts that dominate the world uranium market. The prices in the long-term contracts are a little higher than on the spot market but they are usually a secret.

The spot market price, in other words the price of uranium sold in addition to the long-term contract sales, is now down to the level prevailing in the early 1970's.

Some experts--among them raw materials expert Marian Radetzki of Stockholm University--predict that uranium has again reached its "normal" level and that it will remain there during the rest of the 1980's.

The reason why prices have declined so dramatically in recent years is that there is a large overcapacity in the uranium mining sector and large uranium

stockpiles are being built up, especially in Japan, England and France. Now that they are starting to sell off these reserves prices are being pushed down.

The overcapacity in the uranium mining branch is largely due to the fact that the high estimates for nuclear power expansion made in the 1960's turned out to be inaccurate in most countries. When nuclear power expansion was being planned a number of mines were opened which are now superfluous.

In the United States several uranium mines have been closed down again recently. The main reason for this was lower world market prices in combination with stricter requirements for an improved working environment in the mines.

"We will have a more peaceful price development for some years to come. The high price levels prevailing in the middle of the 1970's will not return. The price will probably remain at the present level for the next few years," said Erik Svenke, who stressed that it is extremely difficult to look into the future when it comes to the uranium market.

At present Sweden has no problem buying uranium abroad. Just a few weeks ago OKG, the Oskarshamnsverkets Power Group, signed an agreement with Australia. We have previous contracts with France, Canada and the United States.

It is estimated that the world's known uranium reserves will last for 100 years supplying the 500 nuclear plants now in operation or under construction.

6578
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BRIEFS

MYRDAL ANTINUCLEAR MOVEMENT--What both superpowers are now competing on in the arms sector at enormous expense is to win a war, to destroy the "enemy." And with nuclear weapons. So wrote Alva Myrdal in an article in the DAGENS NYHETER debate series. A popular campaign based on greater knowledge must now be mobilized--with or without the cooperation of the military--against the gathering nuclear threat that lies over Europe, including northern Europe and even Sweden, she wrote. [Text] [Stockholm DAGENS NYHETER in Swedish 14 Feb 81 p 1] 6578

FORSMARK 2 BEGINS OPERATIONS--On Monday Forsmark 2, Sweden's ninth nuclear reactor, began making deliveries to the electricity network. But there will be another half year of trial operation before commercial production of electricity gets under way. Forsmark 2 will deliver 5.5 TWh (billion kilowatt hours) of electricity a year. That is roughly 5 percent of Swedish electricity production. This information was provided by the Hydroelectric Authority which with Intermediate Power, Inc. owns the nuclear power plant in Forsmark. The seventh reactor, Forsmark 1, is already in full operation and is expected to produce 5.5 TWh this year. The two finished Forsmark reactors have cost about 6.5 billion kronor in all for construction. There are 450 people operating Forsmark 1 and 2. The construction of Forsmark 3 is well under way with 850 people working on it. It is estimated that Forsmark 3 will cost 6-7 billion kronor and it is expected to produce 6.5 TWh a year when it starts up in 1985. During 1981 nine reactors will be supplying power to the electricity network. This means that one out of every three kilowatt hours consumed comes from nuclear power. [Text] [Stockholm DAGENS NYHETER in Swedish 27 Jan 81 p 22] 6578

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31 March 1981